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ABSTRACT

A study compared the effects of a field-based methods course on industrial education (IE) preservice teachers with the effects of a campus-based IE methods course on similar students. Two convenience sample groups were used: eight students enrolled in the IE methods course taught on campus and seven students enrolled in the field-based IE methods course taught at a local middle school. In the field-based model, the preservice teachers completed their methods course, vocational special needs course, and a practicum in the public school setting 3 mornings per week, so they could participate fully in most school activities. The course schedule allowed preservice teachers classroom observation of master teachers with follow-up and actual classroom presentations with follow-up. Preservice teachers assisted with special education students in a self-contained classroom and during mainstreaming activities. Both groups completed a pre- and post-assessment of their development of 35 vocational teacher education competencies. Data were grouped into four competency areas for analysis: teaching process, curriculum, learners, and the profession. Posttest scores for each competency area indicated that field-based methods students rated their competencies higher. An indepth analysis found that the field-based methods students scored significantly higher. (Appendixes contain 12 references, vocational education methods competencies, 4 tables, and instrument.) (YLB)

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Taking Industrial Teacher Education Off Campus

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Introduction

The last fifteen years have seen unprecedented change in America's teacher preparation. Numerous reform initiates have suggested changes in the preparation of teachers, and teacher educators have implemented some suggestions into action. These reform initiatives have included offering teacher education only at the graduate level, demonstrated mastery of core competencies, and delivering teacher education through schools of professional development. However, according to Clark (1988) there is a record of failure in attempts to establish effective collaboration between teacher education and the public schools.

According to Metcalf-Turner and Fischetti (1996) the traditional approach in teacher education is inadequate because there is little interaction between the public schools and teacher educators. Morris, Armstrong, and Price (1997) added that our present teacher education system fails to equip future teachers for the realities of the classrooms they will enter.

Partnerships between public schools and university teacher education are rare (Rigden, 1997b). The reform efforts must include "a structured partnership between the school of education and local school districts. Courses in learning theory ... should incorporate school-based observations and analysis" (Rigden, 1997b, p. 78.) Additionally, Lynch (1997) concluded that most of the current reforms have been targeted towards elementary education and traditional secondary academic disciplines. Vocational teacher education has been slow to initiate any of these reform efforts.

Rational for the Study

Cooper (1996) noted that teacher education has provided essentially the same type of preparation since the late 1800s. She indicated that pre-service teachers often sit through methods courses before they ever encounter various student behaviors or experience typical classroom tasks. The Holmes Group (1990) concurred, noting that teacher education is not organized to encourage the application of theories to practical classroom experiences. Five years later, the Holmes Group (1995) was still indicating that teacher education programs are often absent a connection between knowledge and the skills of practice. Rigden (1997a) concurred that "from the teachers' perspective, this emphasis on theory over practice is not only inappropriate, it is damaging and has resulted in ineffective preparation for the classroom" (p. 24).

One of the major tenets associated with the reform of vocational teacher education was that effective learning best thrives where it is supported by collaboration (Lynch, 1997). This collaboration should include teams of teachers, teacher educators, and others committed to the education of our youth. Lynch further indicated that the teacher educators must be the primary partner in this collaborative effort. In short, the university's role must be redefined and partnerships established between teacher education and local school districts (Rigden, 1997a).

The Holmes Group (1995) noted that tomorrow's teacher education must ensure that theory and practice converge, with research linked to the improvement of teacher education. Rigden (1997a) indicated that to make these changes happen, teacher educators must shift the curricular balance from theory to practice and emphasize field-based experiences. Wilson (1996) noted that this shift would allow pre-service teachers the

opportunity to practice their theory and present teaching materials in a realistic environment. According to Metcalf-Turner and Fischetti (1996), the documentation of successful public school and teacher education collaboration is sporadic at best, offering little criteria for evaluative analysis.

Purpose of the Study

According to Lynch (1997), there does not appear to be critical mass of empirically based knowledge regarding pre-service preparation in vocational teacher education. There is also a lack of data regarding university and public school collaboration in the preparation of vocational education teachers. While at the same time, educational reformers are noting that pre-service teachers "need to get into the classroom earlier, not to observe but to assist" (Rigden, 1997a, p. 26). "However, there has been little research to uncover any significant advantages of a field-based model methods course over the traditional university campus-based methods course" (Cooper, 1996, pp. 139-140).

The purpose of this study was to compare the effects of a field-based methods course on industrial education pre-service teachers with the effects of a campus-based industrial education methods course on similar students.

Research Questions

This study attempted to answer the following research questions.

1. Is there any significant difference between the teaching process competencies of industrial education pre-service teachers who receive their methods course campus-based to those who receive their methods

course in a public school.

2. Is there any significant difference between the curriculum competencies of industrial education pre-service teachers who receive their methods course campus-based to those who receive their methods course in a public school.
3. Is there any significant difference between the learner competencies of industrial education pre-service teachers who receive their methods course campus-based to those who receive their methods course in a public school.
4. Is there any significant difference between the professional competencies of industrial education pre-service teachers who receive their methods course campus-based to those who receive their methods course in a public school.

Framework of the Study

In the spring 1995, a team of vocational teacher educators from the University of Nebraska-Lincoln (UNL), vocational teachers from the Lincoln Public Schools, and Lincoln Public School Vocational Education Director developed a list of Vocational Education Methods Competencies. These competencies were based on national standards, the UNL Teachers College Scholar-Practitioner Model, as well as input for the collaborative team (see Figures 1, 2, 3, & 4). The 35 competencies were divided into four areas; the teaching process, the curriculum, the learners, and the profession based on the four areas of the Scholar-Practitioner Model.

On the basis of on these competencies and the belief of Hopkins, Hoffman, and Moss (1997) that immersion in the school culture provided pre-service teachers the most realistic view of teaching, a field-based

delivery model was developed. The model was to be implemented during the fall semester of 1996. This provided enough lead time to coordinate with the public schools, make necessary course scheduling changes, and communicate with the industrial teacher education majors. The field-based model consisted of the pre-service teachers completing their methods course, their vocational special needs course, and a practicum in the public school setting three mornings per week, 7:30 am to 11:30 am, Monday, Wednesday, and Friday. This daily four hour block of time would allow the pre-service teachers full participation in most school activities as suggested by Wilson (1996). This schedule would also allow the students to complete other university coursework on Tuesdays and Thursdays, plus Monday, Wednesday, and Friday afternoons.

The selection of the field-based site is extremely important according to Metcalf-Turner and Fischetti (1996). The public school selected must have teachers that are "exemplars of best practice" (Metcalf-Turner & Fischetti, p. 296). UNL industrial teacher educators and industrial education teachers from the selected middle school planned a course schedule that allowed the pre-service teachers traditional instructional methodology, classroom observations with follow-up, and actual classroom presentations with follow-up. These classroom observations with their structured follow-up discussions played a crucial role in the model. According to Wilson (1996) pre-service teachers should observe master teachers in groups of two or three and after the observation session discuss with the master teacher what they had observed. Pre-service teachers were also to assist with special education students in both a self-contained classroom and during mainstreaming activities.

Methodology

Two convenience sample groups were used in this study. One group consisted of the students enrolled in the industrial education methods course taught on-campus and the other group consisted of the students enrolled in the field-based industrial education methods course taught at a local middle school.

Students enrolled in the on-campus spring 1996 semester industrial education teaching methods class (n = 8) were asked to complete both a pre-assessment and post-assessment of their development of the 35 vocational teacher education competencies. This was the last methods course to be offered on-campus.

Students enrolled in the field-based fall 1996 semester industrial education teaching methods class (n = 7) were also asked to complete both the pre and post assessment. This group of students was the first to complete the field-based methods course.

The instrument consisted of a listing and description of the 35 competencies and a self-rating for each competency (see Appendix A). Students completed the pre-test the first week of class and then completed the identical post-test the last week of class. Each semester of classes ran for 16 weeks. Students rated themselves from one, not able to demonstrate the competency, to five, able to demonstrate exemplary skill beyond the standard. Thus, the data was in integral form on a five- point Lykert-type scale.

Because of the small sample sizes, pre-test and post-test data were grouped into the four competency areas for analysis (the teaching process, the curriculum, the learners, and the profession). In order to compensate for the non-random assignment of the groups, comparisons were tested via

the analysis of covariance (ANCOVA) statistical treatment as suggested by Best and Kahn (1989). The ANCOVA utilizes the pre-test scores to statistically control for any differences between the groups. According to Best and Kahn the pre-test/post-test with ANCOVA treatment is a strong research design.

Specific methods competencies were tested for significance by means of the Mann-Whitney U-Wilcoxon Rank Sum W test as recommend by Best and Kahn (1989). The authors noted the Mann-Whitney U-Wilcoxon Rank Sum W test is a non-parametric equivalent of the t-test and should be used when parametric assumptions cannot be met. This test is a satisfactory alternative to the t-test.

Findings

The adjusted post-test scores for each of the four competency areas indicated that the field-based methods students rated their competencies higher than the campus-based methods students. The teaching process competency adjusted mean for pre-service teachers from the campus-based course was 3.45, while the field-based adjusted mean was 3.95. The ANCOVA test indicated that the significance of F was p=.108 for the teaching process competencies (see Table 1).

For the curriculum competencies, the campus-based students' adjusted mean was 3.97 and field-based adjusted mean was 4.02 on the five-point Lykert-type scale. These scores provided the significance of F at p=.87 for the curriculum area (see Table 2). Adjusted means for the competencies associated with learners were 3.48 for campus-based and 3.63 for field-based students. ANCOVA significance of F was noted at p=.629 (see Table 3). Examination of the adjusted means for professional

competencies can be seen in Table 4. The mean for pre-service teachers in the campus-based methods course was 4.09, while the field-based students' mean was 4.16. The significance of F was found to be p=.823.

A further in-depth analysis of four individual teaching process competencies found that the field-based methods students scored significantly higher than the campus-based methods students. The Mann-Whitney U-Wilcoxon Rank Sum W test was used for this purpose. For competency number two, "demonstrates an ability to select, plan, and organize activities appropriate for the students' needs, interests, and abilities," the significance was noted at p=.0205. A significance of p=.0205 was also noted for competency number four, "identifies techniques to focus students' attention on the lesson through the use of various techniques." Competency number seven, "identifies and uses appropriate instructional techniques," tested significant at p=.0037. While competency number six, "identifies situations that lead to increased student responsibility, participation, and confidence," noted a significance of p=.0541.

Conclusions

The results from this study indicated that a field-based methods course for pre-service industrial education teachers provided a greater benefit in meeting the UNL Vocational Education Methods Competencies than campus-based methods instruction. The results further answered the call by Cooper (1996) and noted that there is a significant deference between campus-based methods instruction and field-based methods instruction for pre-service teachers. This study also provided at least one data source to support field-based instruction for the preparation of industrial education teachers.

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Vocational Education Methods Competencies

Figure 1. The Teaching Process

Planning:

1. Develops unit/daily plans that demonstrate an understanding of course objectives.
2. Demonstrates an ability to select, plan, and organize activities appropriate for students' needs, interests, and abilities.

Classroom Management:

3. Understands and analyzes standards for behavior and achievement.

Teaching Methods:

4. Identifies techniques to focus students' attention on the lesson through the use of various techniques.
5. Demonstrates instructional charity.
6. Identifies situations that lead to increased student responsibility, participation, and confidence.
7. Identifies and uses appropriate instructional techniques.

Decision Making Skills:

8. Analyzes students' needs, abilities, and interests when making instructional decisions.

Vocational Education Methods Competencies

Figure 2. The Curriculum

Specialty Studies:

9. Exhibits breadth and depth of subject area knowledge.
10. Displays interest and enthusiasm for subjects taught.
11. Demonstrates technical expertise commensurate with subject area exceptions.

The School Curriculum:

12. Demonstrates understanding of the curriculum in the subject areas.

Vocational Education Methods Competencies

Figure 3. The Learners

Developmental Level:

13. Understands the developmental levels, needs, abilities, and interests of individual students.
14. Recognizes special instructional problems associated with different rates of development.

Special Needs:

15. Identifies characteristics of special needs students.
16. Understands and describes strategies to meet the needs of exceptional students.
17. Plans suitable learning activities for special needs students.
18. Identifies educational and behavioral goals in terms of students' disabilities and disadvantages.
19. Adapts the physical and instructional environment for specific learners about the sensory, physical, emotional, and social states in the light of information gained.
20. Aids students in defining goals and objectives that are achievable in terms of their capabilities.
21. Assists special needs students in understanding the capabilities.
22. Refers special needs students to appropriate agencies.
23. Aids parents of special needs students in defining realistic goals.

Figure 3. The Learners (continued)

Equity:

24. Treats all students equally with respect and concern.
25. Recognizes strategies to meet the needs of all students regardless of economic class, handicapping conditions, national origin, race, religion, sex, or sexual orientation.

Assessment:

26. Identifies appropriate formal and informal procedures for assessing students' needs and abilities.
27. Identifies appropriate formal and informal procedures for assessing the effectiveness of lessons.

Evaluation:

28. Analyzes evaluation based on objectives.
29. Identifies appropriate formal and informal procedures for evaluating student learning.

Vocational Education Methods Competencies

Figure 4. The Profession

Attitudes:

30. Exhibits receptive attitude toward critiques of professional performance and suggestions made for improvement.
31. Identifies specific goals for continued professional growth.
32. Demonstrates commitment to education.
33. Develops poise and confidence.
34. Develops sense of professionalism and ethics.
35. Develops deeper understanding of social and political context in which teaching and learning occur.

Table 1

The Teaching Process

Pre-Test and Post-Test Scores

Group	Pre-Test M	Pre-Test SD	Post-Test M	Post-Test SD	Adjusted Post-Test M
Traditional (n = 8)	2.30	.747	3.20	.710	3.45
Field-based (n = 7)	3.04	.477	4.20	.499	3.95

ANCOVA

Source of Variance	SS	df	MS	F	Sig of F
Between groups	.67	1	.67	3.02	.108
Regression	2.34	1	2.34	10.50	
Within groups	2.68	12	.22		

Table 2

The Curriculum: Pre-Test and Post-Test Scores

Group	Pre-Test M	Pre-Test SD	Post-Test M	Post-Test SD	Adjusted Post-Test M
Traditional (n = 8)	2.86	1.03	3.78	.589	3.97
Field-based (n = 7)	3.61	.876	4.21	.756	4.02

ANCOVA

Source of Variance	SS	df	MS	F	Sig of F
Between Groups	.01	1	.01	.04	.87
Regression	3.26	1	3.26	15.01	
Within groups	2.60	12	.22		

Table 3

The Learners

Pre-Test and Post-Test Scores

Group	Pre-Test M	Pre-Test SD	Post-Test M	Post-Test SD	Adjusted Post-Test M
Traditional (n = 8)	2.13	.647	3.27	.629	3.48
Field-based (n = 7)	2.83	.549	3.83	.567	3.63

ANCOVA

Source of Variance	SS	df	MS	F	Sig of F
Between groups	.06	1	.06	.25	.629
Regression	1.60	1	1.60	6.18	
Within groups	3.10	12	.26		

Table 4

The Profession

Pre-Test and Post-Test Scores

Group	Pre-Test M	Pre-Test SD		Post-Test M	Post-Test SD	Adjusted Post-Test M
Traditional (n = 8)	3.25	.817	8	3.98	.721	4.09
Field based (n = 7)	3.60	.793	7	4.26	.757	4.16

ANCOVA

Source of Variance	SS	df	MS	F	Sig of F
Between groups	.02	1	.02	.05	.823
Regression	3.24	1	3.24	10.15	
Within groups	3.83	12	.32		

Appendix A

Vocational Education Methods Competencies

Vocational Education Methods Competencies

Self Rating Description

1 = Not able to demonstrate the competency (unsatisfactory)
2 = Could demonstrate the competency with supervision
3 = Could demonstrate the level of skill expected of a first-time student teacher (the Standard)
4 = Could demonstrate methods/skills better than most student teachers
5 = Able to demonstrate exemplary methods/skills beyond the Standard; the need for first-year supervision will be minimal
Blank = Competency not observed (covered in course)

1.00 TEACHING PROCESS — Rating

1.10 Planning: Plans activities to achieve learner objectives _____
- 1.11 Develops unit/daily plans that demonstrate an understanding of course objectives. _____
- 1.12 Demonstrates an ability to select, plan, and organize activities appropriate for students' needs, interests, and abilities. _____

1.20 Classroom Management: Organizes the environment to analyze, contrast and compare learning _____
- 1.21 Understands and analyzes standards for behavior and achievement. _____

1.30 Teaching Methods: Presents tasks at the pupil's instructional level _____
- 1.31 Identifies techniques to focus students' attention on the lesson through the use of various techniques. _____
- 1.32 Demonstrates instructional clarity. _____
- 1.33 Identifies situations that lead to increased student responsibility, participation, and confidence. _____
- 1.34 Identifies and uses appropriate instructional techniques. _____

1.40 Decision Making Skills: Identifies appropriate decisions about the teaching act _____
- 1.41 Analyzes students' needs, abilities, and interests when making instructional decisions. _____

2.0 THE CURRICULUM — Rating

2.10 Specialty Studies: Exhibits knowledge of content area(s) _____
- 2.11 Exhibits breadth and depth of subject-area knowledge. _____
- 2.12 Displays interest and enthusiasm for subject(s) taught. _____
- 2.13 Demonstrates technological expertise commensurate with subject-area expectations. _____

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2.20 The School Curriculum: Follows school curriculum and policies _____

2.21 Demonstrates understanding of the curriculum in the subject areas. _____

3.00 THE LEARNERS Rating

3.10 Developmental Level: Considers students' developmental level in teaching _____

3.11 Understands the developmental levels, needs, abilities, and interests of individual students. _____

3.12 Recognizes special instructional problems associated with different rates of development. _____

3.20 Special Needs: Meets the special needs of all students _____

3.21 Identifies characteristics of special needs students. _____

3.22 Understands and describes strategies to meet the needs of exceptional students. _____

3.23 Plans suitable learning activities for special needs students. _____

3.24 Identifies educational and behavioral goals in terms of students' disabilities and disadvantagement. _____

3.25 Adapts the physical and instructional environment for specific learners about the sensory, physical, emotional, and social states in the light of information gained. _____

3.26 Aids students in defining goals and objectives that are achievable in terms of their capabilities. _____

3.27 Assists special needs students in understanding their capabilities. _____

3.28 Refers special needs students to appropriate agencies. _____

3.29 Aids parents of special needs students in defining realistic goals. _____

3.30 Equity: Promotes a positive self-concept for students _____

3.31 Treats all students equally with respect and concern. _____

3.32 Recognizes strategies to meet the needs of all students regardless of economic class, handicapping conditions, national origin, race, religion, sex, or sexual orientation. _____

3.40 Assessment: Identifies and diagnoses learner needs _____

3.41 Identifies appropriate formal and informal procedures for assessing students' needs and abilities. _____

3.42 Identifies appropriate formal and informal procedures for assessing the effectiveness of lessons. _____

3.50 Evaluation: Uses data to make decisions about teaching _____

3.51 Analyzes evaluation based on objectives/intentions. _____

3.52 Identifies appropriate formal and informal procedures for evaluating students' learning. _____

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4.00 THE PROFESSION — Rating

4.10 Attitudes: Shows enthusiasm and interest in teaching _____

- 4.11 Exhibits receptive attitude toward critiques of professional performance and suggestions made for improvement. _____
- 4.12 Identifies specific goals for continued professional growth. _____
- 4.13 Demonstrates commitment to education. _____
- 4.14 Develops poise and confidence. _____
- 4.15 Develops sense of professionalism and ethics. _____
- 4.16 Develops deeper understanding of social and political milieu in which teaching and learning occur _____

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